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The idea of corridors of native vegetation linking major remnants of native bush is an old concept that has been revived in recent years with the rise of Landcare groups through the Shire.

The Federal and State governments (Appendix) both have a similar vision that biolinks/corridors enable native animals and flora to adapt to changes in our climate – with the corridors (biolinks) allowing animals to migrate to wherever they are most comfortable and able to survive.



Investing in the future – first tree planted in the Myrning Creek Biolink

Biolinks also help prevent isolation of small populations of native species caused by the fragmentation of the landscape through roads, farming, railways and other human activities. The outcome for isolated communities is either inbreeding or they die out - neither outcome being satisfactory.

The Shire of Moorabool is fortunate in that it still has large areas of native vegetation in the north and south, and waterways that generally go from north to south. The waterways are often the most practical location for biolinks as their development provides multiple benefits - shelterbelts for farmers and fenced off waterways – that stop stock deaths from misadventure and incursions by the neighbour's stock. Water authorities really appreciate the biolinks along waterways as they lead to an improvement in water quality through shading of the waterway, filtering of run-off from farmland and a reduction of siltation caused by treading by cattle and sheep.

Biolinks may be associated with other amenities such as a shared walking/cycling trail, and the preservation of iconic species such as koalas, pygmy possum and phascogales. There is discussion on a shared trail and biolink to commemorate the route taken by the serviceman from Ballarat who signed up for the First World War (1914 – 1918) – stretching from the Avenue of Honour in Bacchus Marsh to the Avenue of Honour at

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Alfredton (Ballarat west). These trails may add to the tourism values in the Shire as people travel from Melbourne and Ballarat travel sections of the trails.

There are some potential drawbacks if the biolinks are not managed – fences damaged during floods, the need for capital to install off-stream watering points for farm animals, and maintenance against weed and rabbit infestations. When biolinks are established there needs to be honest discussion between the interested parties and a genuine sharing of the costs and benefits.

The issue of change to fire risk has been raised on occasions but there is little evidence to suggest that constructed biolinks significantly change the risk of fire.

Local biolinks should also be viewed as contributing to and connecting to regional and national networks of biolinks. A biolink along the Werribee River is planned to extend all the way from the Wombat State Forest to the mouth of the river at Werribee South. The northern end of the north-south links in the Shire of Moorabool will join to the proposed Great Southern Biolink which stretches along the spine of the Great Dividing Range from Mt Arapiles (west of Horsham) to Cape York Peninsula at the top-end of Queensland. The southern end of local biolinks will join biolinks in the Shire of Golden Plains and the Greater City of Geelong.



The biolink development gathers pace along Myrning Creek at the Conservation Volunteers Australia, W James Whyte Island Reserve

TERRESTRIAL BIOLINKS (those not following water courses) will connect remnant vegetation between waterways. The most significant terrestrial biolinks planned for the Shire of Moorabool is a proposed link between the Brisbane Ranges and Werribee River, and a link between the two mountains (Mt Buninyong and Mt Warrenheip) – the ‘Two Mountains Koala Trail’.

There will need to be significant external funding if the biolinks strategy is to be fully realised. Individual landowners have the annual costs of maintenance of the vegetation, however the capital cost of fencing,

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initial destruction of rabbit harbour and woody weed removal, and planting of the biolink – is usually well beyond the individual landowner’s resources. It is not unreasonable that external funding be provided as the landowner is providing an asset that has much wider public benefit than that which they derive.

Sources of external support for construction of biolinks have been identified and include – Federal Government (through State Government (Department of Sustainability and Environment), water authorities (Western Water, Melbourne Water, Southern Rural Water, Central Highlands Water, Barwon Water), state agencies involved in related infrastructure – catchment management authorities, roads, rail, power, Parks Victoria. Private sources include philanthropic groups and corporate sponsors (mainly through Landcare Australia Limited and Grow West). Landcare groups will provide in-kind support as they co-ordinate and contribute labour and equipment and local intelligence to individual projects.

Proposed biolinks across the Shire include the following:

1. **The Moorabool River biolink** connecting the Wombat State Forest in the north with the Shire of Golden Plains in the south (at Morrisons). Above Morrisons, the biolink will split into two corridors – one following the Eastern Moorabool River, and the other following the Western Moorabool River (source: Shire of Moorabool report 2003)
2. **The Werribee River biolink** running the length of the river from the Wombat State Forest north of Korweinguboora to south east at Melton Reservoir (where it joins with works in the Shire of Melton) (source: Leadwest: 2012)
3. **The north and south biolink** connecting the Brisbane Ranges (south) with the Lerderderg State Forest in the north by means of the Korkuperrimul, Myrniong, and Stony Hut creeks – as far as the Werribee River Gorge Park, and then south as a terrestrial corridor via the Rowsley Valley and intersecting with the Whitehorse Creek, Parwan Creek, and Yaloak Creek. (source Grow West: 2004).

This biolink is well along the way to being constructed, largely thanks to the efforts of landowners, Grow West, Pentland Hills Landcare Group, Rowsley Landcare Group, and Conservation Volunteers Australia with significant funding support provided by Melbourne Water, DEPI-Vision for Werribee Plains, and the Federal Government’s Biodiversity Fund.

Other biolinks proposed to add value to these major enterprises include;

4. **The Brisbane Ranges – Little River biolink** along the river that will continue all the way to the Western Treatment Plant downstream of Little River, and to the You Yangs, and to the new Werribee Plains Grasslands
5. **Parwan Creek biolink** to connect the Werribee River biolink to the north-south biolink (No.3) providing an alternative route to the river corridor through Bacchus Marsh.
6. **Ballark – Mt Wallace terrestrial biolink** to link the Brisbane Ranges with the Moorabool River valley.
7. **‘Two-Mountains Koala Trail’ biolink** between Mount Warrenheip and Mount Buninyong , to facilitate migration of koalas from the community at Mount Buninyong. This will largely be a terrestrial biolink.
8. **The Bullengarook – Coimadai biolink** to facilitate migration of species east and west between the Lerderderg State Park (Lerderderg River valley) and the Lerderderg State Park (Pyrete Range).

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9. **'A Land Fit For Heroes'** is the concept of a biolink connecting Ballarat and Bacchus Marsh, complete with shared trail, to honour the 100th year of the landing at Gallipoli in WW1. The avenues-of-honour in Bacchus Marsh and Ballarat will form the start and finish of the biolinks. The project is supported by the Port Phillip and Westernport Catchment Management Authority and Landcare Australia Ltd.

The Port Phillip and Westernport Catchment Management Authority, through its subsidiary Grow West reported in its 2012-13 Annual Report - *Achievements in 2012/13 were:*

- *58 ha of revegetation,*
- *70 ha of protection / enhancement,*
- *6 km of waterways fenced and revegetated in Whitehorse Creek Biolink;*
- *initiating a 12 km biolink between Werribee Gorge and Brisbane Ranges (296 ha of revegetation and 52 ha of enhancement and protection);*
- *a VicRoads partnership for extensive woody weed removal and warren destruction (110 ha); and*
- *site preparation for direct-seeding for biolink in Ingliston Park.*

Establishing Priorities

The construction of biolinks must always be a coalition-of-the-willing. In recent years the coalition has been between (a) landowners (b) a co-ordinating group and (c) funding agencies. Identifying opportunities for these three resources to join together will be a priority for future work by the Moorabool Landcare Network.

Early work by Grow West was a combination of landowners (provided the land for the revegetation works), Grow West (project manager), and corporates (provision of funds).

In recent times the combination has been landowners (provision of land for revegetation works), Landcare Groups (project manager), and DEPI and Melbourne Water (provision of funds).

Biolinks along major waterways are likely to attract investment by the State government and water authorities – as the State government is seeking investment in healthy waterways (through its Healthy Waterways strategy) and water authorities are seeking better quality water for potable use and environmental flows.

The Federal Government is likely to support biolinks that help provide habitat for many species and help animals and plants adapt to climate change. The major north-south and east-west biolinks are going to be the most attractive, including a strategy to by-pass Bacchus Marsh. The north-south links will link to the national biolink strategy and the Werribee River biolink will link marine parks along the coast of Port Phillip Bay and the upper reaches of the river – especially important for fish (eg black fish, Australian grayling), platypus, and other aquatic species (eg eels).

There appears to be sufficient interest from landowners along waterways for successful projects into the future, and the Landcare movement and Grow West can provide the necessary project management skills.

Smaller biolink projects may be a priority if the State government continues to invest in Landcare Groups/Networks as a means of capacity building for rural communities. Biolinks, by their nature, are seen

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in a very positive light by communities who are enthused by the notion of a community working together to better their future.



The creation of biolinks becomes a large community movement

The biolink 'A Land Fit For Heroes' may appear to come from obscurity but has its origins in a celebration of the route of the early travellers between Melbourne and Ballarat, in particular the route taken by the first enlistments for WW1 by service men and women from Ballarat and further west. The Australian Government is keen on the idea of a 'living monument' and a biolink meets this criteria, especially if linked with a shared trail for cycling and walking and local tourism.

It will be necessary for the leaders of Landcare groups, Grow West, and other rural organisations to continue to monitor opportunities for investment in biolinks.



Landowners learn how to monitor impact of biolinks on water quality

Support Requested of Shire of Moorabool

The proposed biolink strategy will be greatly enhanced if it has the support of the Shire of Moorabool for the following reasons;

1. Biolinks imply strategic land planning – the province of Local Government. It would of great help if the route of the biolinks were included in planning overlays in the Shire to alert any proposed change to land use that might impact on the viability of the biolinks. Council will need to determine priorities and the overlay will alert them to an already proposed use of the land which needs to be taken into account, and for which a solution (hopefully Win-Win) is required. The role of Council will be especially important for biolinks that are located in or near urban areas.
2. Biolinks have implications for the Council’s weed strategy and will be greatly assisted if priorities for work on council managed land is consistent with the weed management works associated with the individual biolinks.
3. Landowner work on the biolinks may be included as a contribution toward a rebate, if an environmental rebate is introduced for rural landowners.
4. The endorsement of Council is a significant benefit to groups applying for state and federal funding. This is most effective when included as part of an agreed overall strategy for the Shire.
5. Council can support pest plant and animal control through local by-laws under the Local Government Act and call upon DPI to further add to their compliance standards.

Ensuring Protection of Biolinks

Ideally biolinks would be protected by land covenants (eg Section 173 Agreement) however in practice there are few landowners who wish to pursue this level of protection. The most common arrangement is for landowners to enter into 5-year agreements with the project manager or funding agency to manage the land in accordance to the intention to develop and maintain a biolink.

Carrots-and-Sticks from Council and DEPI

The Local Government Act provides measures that enable a council to seek compliance on matters relating to pest plants and animals in a biolink.

Landowners failing to comply may also be referred to relevant state government department for further compliance measures.

Another measure open to the Shire is to offer positive incentives for land improvement such as biolinks, often through a rural rebate scheme – where a percentage of the annual rates are rebated if the landowner demonstrates they have taken measures to improve the natural environment.

Next Steps

1. Encourage the Moorabool Shire Council to include biolinks as part of their Environment Strategy.
2. Ensure all biolinks have an active monitoring system for recording changes in animal diversity and health of waterways
3. Ongoing activity of MLN Inc is to seek funding for investment in biolinks
4. Support Grow West as it seeks to attract corporate and federal funding for biolinks.
5. MLN to promote the biolinks strategy amongst the rural and urban community across the Shire of Moorabool.



Myrning Primary School students made nest boxes for pygmy possums



Nest box installed and location recorded with GPS

What will Success Look Like?

A vision of the future with the biolinks in place might include the following;

- Water quality in the local river systems improved to the point where black fish are once again hunted for sport on a catch-and-release basis.
- There are regular sightings of platypus in the rivers and major creeks.
- Pygmy possums have been found in nesting boxes as far south as Myrning.
- A group has been formed of landowners along one of the biolinks to form a tourism trail based on ecotourism, recreational cycling and bushwalking.
- The 'Land Fit For Heroes' biolink and trail is being copied in another state.
- Two major federal grants have been received to finish the connections along the Werribee and Moorabool rivers.
- Farmers south of the Western Highway have commented on sighting wombats on their property.
- Rabbits are present but are quickly brought under control through ripping of burrows when they are identified.
- Farmers along the biolinks are proud of them and derive an income for their maintenance as ecoservice grants and rate rebates.
- A growing trails network associated with the biolinks is attracting tourists from Melbourne for cycling around the Shire
- Interpretive signage is erected along major roads to announce the biolinks and warn motorists of wildlife, cyclists and pedestrians in the vicinity.
- The annual survey shows an increase in diversity of native birds throughout the Shire.
- Shire residents are calling for an extension of biolinks to enhance other areas of the Shire.



Existing biolinks are extended – landowners have bought the vision

Appendix 1

Alignment of MLN biolink strategy to help meet National and State Biodiversity Objectives

<u>Moorabool Landcare Network Strategy</u>	<u>Australia's Biodiversity Conservation Strategy 2010 - 2030</u>
The MLN recognises that private land owners and farmers are the key to success of the biolink and seek funding to enable them to invest in the corridors (on whose land over 80% of the work will be undertaken)	The continued contribution from farmers (who manage over 60% of the Australian landscape), primary industries and community groups will be important in meeting this challenge (P3)
The Biolink strategy aims to improve the responsiveness of the remaining ecosystems to major threats as follows;	<i>Ecosystem resilience</i> is the capacity of an ecosystem to respond to changes and disturbances, yet retain its basic functions and structures.
The linking of remnants with the major state forests enables species to breed without the risk of inbreeding that is currently present with a highly fragmented landscape	habitat loss, degradation and fragmentation
The biolink plantings are installed with 5-year agreements with landowners to manage invasive species (a major commitment by land owners), including control of rabbits, weeds that harbor rabbits, and other local weeds	invasive species
Biolink plantings are fenced to exclude livestock. Landowners are also encouraged to include country that is unsuited for agriculture eg escarpments, eroded areas, gullies	unsustainable use and management of natural resources
Waterways are fenced by the land manager to exclude stock access – with funding support from the local manager of the waterways (Melbourne Water, Corangamite CMA). Some off-stream water storage is permitted for watering livestock. Rapid improvement in water quality is noted when this occurs.	changes to the aquatic environment and water flows
The impact of biolinks on fire risk is not well understood. Some believe it adds to the risk, others report there is no increase in risk, and a third group believe the biolinks may decrease the risk of fire by slowing its speed (such as occurs with shelterbelts).	changing fire regimes
The biolinks should enable animal species to migrate in particular eg small mammals, reptiles and birds. Plant species may also benefit, especially if their seed needs to be carried by animals to propagate. The MLN intends to monitor migration of iconic species eg Eastern Pygmy Possum, wombats, echidna. Annual bird surveys will be conducted to check for change in the diversity of species following plantings and other restoration works.	climate change
<p>Groups comprising the MLN have been effective in engaging their local community and will be supported to continue doing this. Tree planting days in 2012 attracted over 1000 people from schools, local communities, international students. This number is expected to increase over the next two years.</p> <p>The Moorabool Shire Council is supportive of the work of MLN and is currently working toward endorsement of the Biolinks Strategy.</p> <p>All schools in the Shire are being encouraged to start Junior Landcare Groups and become involved in relevant activities – building nest boxes, attending planting days, Waterwatch monitoring, plant and animal identification.</p> <p>MLN also conducts an expo for land managers – an activity that is highly respected and is now in its 4th year.</p>	Engaging the community in conservation works

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<u>Moorabool Landcare Network Strategy</u>	<u>Australia's Biodiversity Conservation Strategy 2010 - 2030</u>
<p>The MLN is a newly formed organisation, with the aim of better co-ordinating the activities of existing Landcare groups (11) and Friends groups (5) and to</p> <ul style="list-style-type: none"> (a) Develop new Landcare groups where Landcare is under-represented and works are needed (b) Adopt a co-ordinated approach to seeking and managing funds for biodiversity works (c) Seek partnership investments <p>At present most strategic partnerships are aimed at enhancing resources to contribute toward tree planting days and involve local organisations and in-kind support eg service clubs, schools, hall committees, 4xwheel clubs. MLN is seeking DGR tax status to further enhance its capacity to attract partnerships and support.</p> <p>MLN is also seeking a strategic partnership with the Moorabool Shire Council to better co-ordinate weed control, and implement planning overlays that minimise fragmentation of the landscape.</p> <p>The two CMAs (Port Phillip and Corangamite) are already partners in the various activities and help to develop and promote events and provide funding to support the activities of the Landcare groups.</p> <p>Melbourne Water has been particularly helpful in co-investing in biolinks along waterways in their catchment area.</p> <p>MLN is now seeking to establish formal relationships with the Leigh Catchment Group, Western Melbourne Catchments Network, Upper Campaspe Landcare Network and the Central Victoria Biolinks Consortium to provide wider linkages for the biolinks.</p>	<p>enhancing strategic investments and partnerships</p>
<p>This is an area requiring further work by MLN. Our most likely partnership will be with the Wathaurong Co-operative (Geelong) and the Ballarat and District Aboriginal Co-operative (BADAC)</p>	<p>increasing Indigenous engagement</p>
<p>The Moorabool Shire has identified major biodiversity assets as the two forests Wombat State Forest, Lerderderg State Forest, Brisbane Ranges National Park, Werribee Gorge State Park, and a number of high-value remnants – grasslands and woodlands in particular. There are no large natural water bodies in the area but many small wetland areas.</p> <p>MLN has two Landcare groups and four Friends groups working in and adjacent to the major public parks and forests and seeks to engage both public authorities and private individuals in protecting these assets – especially through weed control and controlling pest animals (esp rabbits, feral cats, and foxes).</p> <p>The Landcare groups abutting the forests are seeking to initiate biolinks to extend the ecosystem of the forests, but taking account of the history of the terrain (eg moving from forest to woodland to grasslands).</p> <p>MLN has protection of biodiversity as its primary theme and it is in this context the group is actively seeking funding support to extend the biolinks.</p> <p>The fencing of biolinks from farm animals enable the ecosystem within the biolink to act as naturally as possible – taking into account the planting of both under-storey plants when developing a biolink. There is considerable local advice and experience in the design of new plantings.</p>	<p>Protecting biodiversity to build ecosystem resilience and re-establishing ecosystem functions</p>
<p>MLN acts a clearing house for groups and the sharing of information on activities and the details of projects is an integral part of its activities.</p> <p>Members recently decided to have a co-ordinated approach to planting days in 2013 to avoid overlap and to expand the number of participants.</p> <p>Whilst over 40,000 plants were planted this year, it is expected this will</p>	<p>The need to get measurable results on the impact of work being undertaken through improving and sharing knowledge, delivering conservation services efficiently, implementing robust monitoring and</p>

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<u>Moorabool Landcare Network Strategy</u>	<u>Australia's Biodiversity Conservation Strategy 2010 - 2030</u>
<p>increase to around 60,000 next year using a combination of direct seeding and planting days – with planting moving from east to west in line with the generally preferred dates for planting. This will increase efficiency in publicity of events, co-ordination of equipment, and negotiations with nurseries.</p> <p>MLN is working with Landcare groups to institute Waterwatch water quality monitoring (for its rigour) and annual/biannual bird surveys with Birds Australia.</p> <p>One of the Landcare groups is developing a phone app called Weed Tracker which will be used to record and monitor priority weed infestations in each area and is expected to be ready by June 2013, (depending on funding). Nesting boxes (supported by infra-red motion-sensor cameras) will be used along the biolinks to detect migration of small mammals.</p> <p>Whilst the above measures may not be consistent with other areas, they will provide a robust suite of monitoring devices to record changes in the local environment.</p>	<p>evaluation that is consistent with other areas (Pp8-9)</p>
<p>MLN needs to establish a baseline statement of organisations involved in Biodiversity conservation activities, before embarking on a program to lift this performance. This will be completed by January 2013.</p>	<p>Achieving e a 25% increase in the number of Australians and public and private organisations who participate in biodiversity conservation activities.</p>
<p>MLN is unlikely to contribute to this target in the short term but may contribute post-2014 when the group expects to have more rigorous systems to employ contractors staffed by indigenous people. (it is noted that the first two indigenous rangers are just now being employed by the Wurundjeri Co-op so likely to be some time before having sufficient staff to be employed in projects in this area.</p>	<p>By 2015, achieve a 25% increase in employment and participation of Indigenous peoples in biodiversity conservation.</p>
<p>MLN is able to contribute to this objective – our contribution is likely to be 200ha.</p>	<p>By 2015, 1,000 km2 of fragmented landscapes and aquatic systems are being restored to improve ecological connectivity.</p>
<p>MLN is able to contribute to this objective with our contribution being 200ha</p>	<p>By 2015, achieve a national increase of 600,000 km2 of native habitat managed primarily for biodiversity conservation across terrestrial, aquatic and marine environments.</p>
<p>MLN linkages will be at the southern end of the Great Divide linkage and will provide key connectivity along the southern edge – linking the Brisbane Ranges with the Wombat State Forest and remnant woodlands to these major systems, mainly along waterways, with around 150km by 2015, and 500km when the biolink strategy is fully implemented. MLN is working in conjunction with the Central Victoria Biolink Consortium to ensure our work is integrated.</p>	<p>. By 2015, four collaborative continental-scale linkages are established and managed to improve ecological connectivity.</p>
<p>MLN is developing a weed strategy that aims to exceed the national objective for selected species Serrated Tussock, African Boxthorn and Gorse). Our strategy is to (a) introduce 'Weed Tracker' phone app and software to identify and monitor invasive species, (b) develop a co-ordinated weed control program with authorities working on public land and neighbouring land owners, (c) seek use of the Local Government Act to 'stiffen up' control of weeds on private land, and (d) work with DPI to</p>	<p>By 2015, reduce by at least 10% the impacts of invasive species on threatened species and ecological communities in terrestrial, aquatic and marine environments.</p>

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<u>Moorabool Landcare Network Strategy</u>	<u>Australia's Biodiversity Conservation Strategy 2010 - 2030</u>
<p>implement the proposed Invasive Weeds Act where recalcitrant fail to respond to persuasion and requests. The removal of rabbit harbour for rabbits is expected to be effective but overall results are uncertain given the species is now resistant to biological control measures.</p>	
<p>MLN will continue to collaborate with academics and State funded scientists wherever possible, and will continue to engage through joint research projects (eg hosting of research sites, conduct of seminars). Scientists will continue to be invited to give seminars where there will be a robust exchange of experiences and observations.</p>	<p>By 2015, nationally agreed science and knowledge priorities for biodiversity conservation are guiding research activities.</p>
<p>MLN is seeking to align its activities with the national strategy, and in doing so is advocating for Moorabool Shire Council to use the compliance measures at its disposal to support the national strategy – especially through a weed control strategy, compliance in weed control and removal of native vegetation and through planning to support the biolinks.</p>	<p>By 2015, all jurisdictions will review relevant legislation, policies and programs to maximise alignment with Australia's Biodiversity Conservation Strategy.</p>
<p>MLN will work with national and State organisations charged with this responsibility and will contribute to the establishment of these standards as the opportunity presents itself.</p>	<p>By 2015, establish a national long-term biodiversity monitoring and reporting system (P10)</p>
<p>MLN will use a mixture of activities – relevant to each niche environment</p> <ul style="list-style-type: none"> (a) Link remnant vegetation where possible – with 'stepping stones' or complete links (Mt Doran, Lal Lal) (b) Increase % of native vegetation in grasslands (Bullark, Balliang, Parwan) (c) Establish linkages north and south between major areas of native vegetation (Wombat State Forest and Brisbane Ranges National Park), and east west between the Moorabool River and Brisbane Ranges. <p>MLN activity is a "coalition of the willing". We understand that we cannot achieve linear linkages so we have to identify and implement second-best and other strategies that achieve the overall goal of 'genetic flows across the landscape'.</p> <p>MLN is also aware that multiple linkages are required for risk management as one linkage may be severely impaired by a landowner acting inappropriately, denial of access to private property, fire, predators, etc. Management must be flexible, but always with an eye on the final objective. The group has ample experience of landowners who change their minds and decide to become participants after being former vehement opponents.</p>	<p>Connectivity can take a number of forms – continuous linkages, stepping stones, and mixed areas. (pp23-24)</p>

Note: Alignment of MLN Biodiversity Strategy with State Government Objectives

In the absence of a clear biodiversity strategy by the government, the MLN strategy is aligned to the document "Securing Our Natural Future" 2009.